

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 08, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 08, 2014 07:00 to December 09, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area and an additional three units throughout the day by frac tanks near the designated decon areas. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were data-logged along the facility perimeter collocated with AreaRAE stations 1, 2, 3, and 4. Table 3 summarizes data-logged PM_{10} data from these units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 08, 2014 07:00 – December 09, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	29	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O ₂	MR+ / MR Pro	25	25	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	27	27	0.019	0.009 - 0.034 mg/m ³
	SO ₂	MR+ / MR Pro	25	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	Gastec 8La	2	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	4	0	NA	<1 ppm
	HCl	Gastec 14L	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	4	0	NA	<1 %
	O ₂	MR+ / MR Pro	3	3	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	2	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	1	1	0.007	0.007 - 0.007 mg/m ³
	SO ₂	MR+ / MR Pro	4	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	4	0	NA	<0.1 ppm
Work Area	Cl ₂	Gastec 8La	5	0	NA	<0.05 ppm
	H ₂ S	Gastec 4LL	3	0	NA	<0.1 ppm
		MR+ / MR Pro	25	0	NA	<1 ppm
	HCl	Gastec 14L	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	24	0	NA	<1 %
	O ₂	MR+ / MR Pro	8	8	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	3	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	6	6	0.012	0.004 - 0.042 mg/m ³
	SO ₂	Gastec 5Lb	2	0	NA	<0.1 ppm
		MR+ / MR Pro	24	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	25	0	NA	<0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 08, 2014, 2014 07:00 – December 09, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H ₂ S	5393	682	0.2 ppm	0.1 - 0.6 ppm
	LEL	5393	0	NA	< 1 %
	SO ₂	5393	3	0.1 ppm	0.1 - 0.1 ppm
	VOC	5393	0	NA	< 0.1 ppm
Unit 02	H ₂ S	5551	1164	0.1 ppm	0.1 - 0.2 ppm
	LEL	5551	0	NA	< 1 %
	SO ₂	5551	0	NA	< 0.1 ppm
	VOC	5551	603	0.1 ppm	0.1 - 1.5 ppm
Unit 03	H ₂ S	5043	223	0.1 ppm	0.1 - 0.2 ppm
	LEL	5043	0	NA	< 1 %
	SO ₂	5043	0	NA	< 0.1 ppm
	VOC	5043	7	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H ₂ S	5516	273	0.1 ppm	0.1 - 0.2 ppm
	LEL	5516	0	NA	< 1 %
	SO ₂	5516	0	NA	< 0.1 ppm
	VOC	5516	1	0.1 ppm	0.1 - 0.1 ppm
Unit 05	H ₂ S	1786	655	0.2 ppm	0.1 - 1.1 ppm
	LEL	1786	0	NA	< 1 %
	SO ₂	1786	0	NA	< 0.1 ppm
	VOC	1786	0	NA	< 0.1 ppm
Unit 06	H ₂ S	1691	562	0.2 ppm	0.1 - 0.6 ppm
	LEL	1691	0	NA	< 1 %
	SO ₂	1691	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	1691	259	0.1 ppm	0.1 - 0.6 ppm
Unit 08	H ₂ S	1772	456	0.2 ppm	0.1 - 0.4 ppm
	LEL	1772	0	NA	< 1 %
	SO ₂	1772	24	0.1 ppm	0.1 - 0.1 ppm
	VOC	1772	1	0.1 ppm	0.1 - 0.1 ppm

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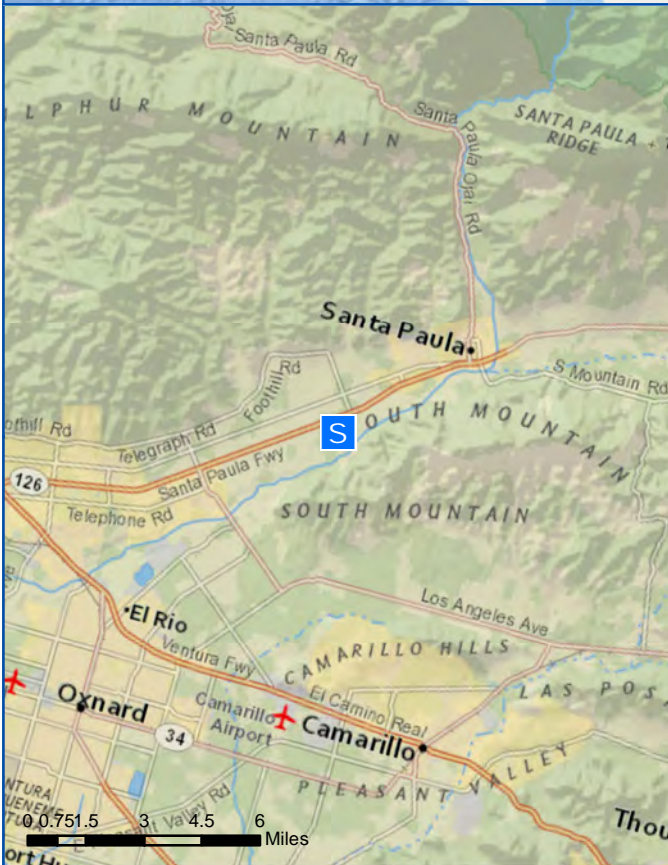
Table 3: AM510 PM₁₀ Monitoring Summary¹
 December 08, 2014, 2014 07:00 – December 09, 2014 07:00


Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	9483	9483	0.015	0.002 - 1.557 mg/m ³
10704074	AR02	8531	8531	0.046	0.003 - 0.606 mg/m ³
10408087	AR03	1008	385	0.013	0.001 - 0.103 mg/m ³
10704072	AR04	8488	8488	0.009	0.002 - 0.059 mg/m ³

Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend
 Site Location



0 50 100
Feet



0 250 500 1,000
Feet



Legend

-  FRT Location
-  Site Location



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site



Legend

Monitoring Location

- Detect (0.004 - 0.042 mg/m³)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

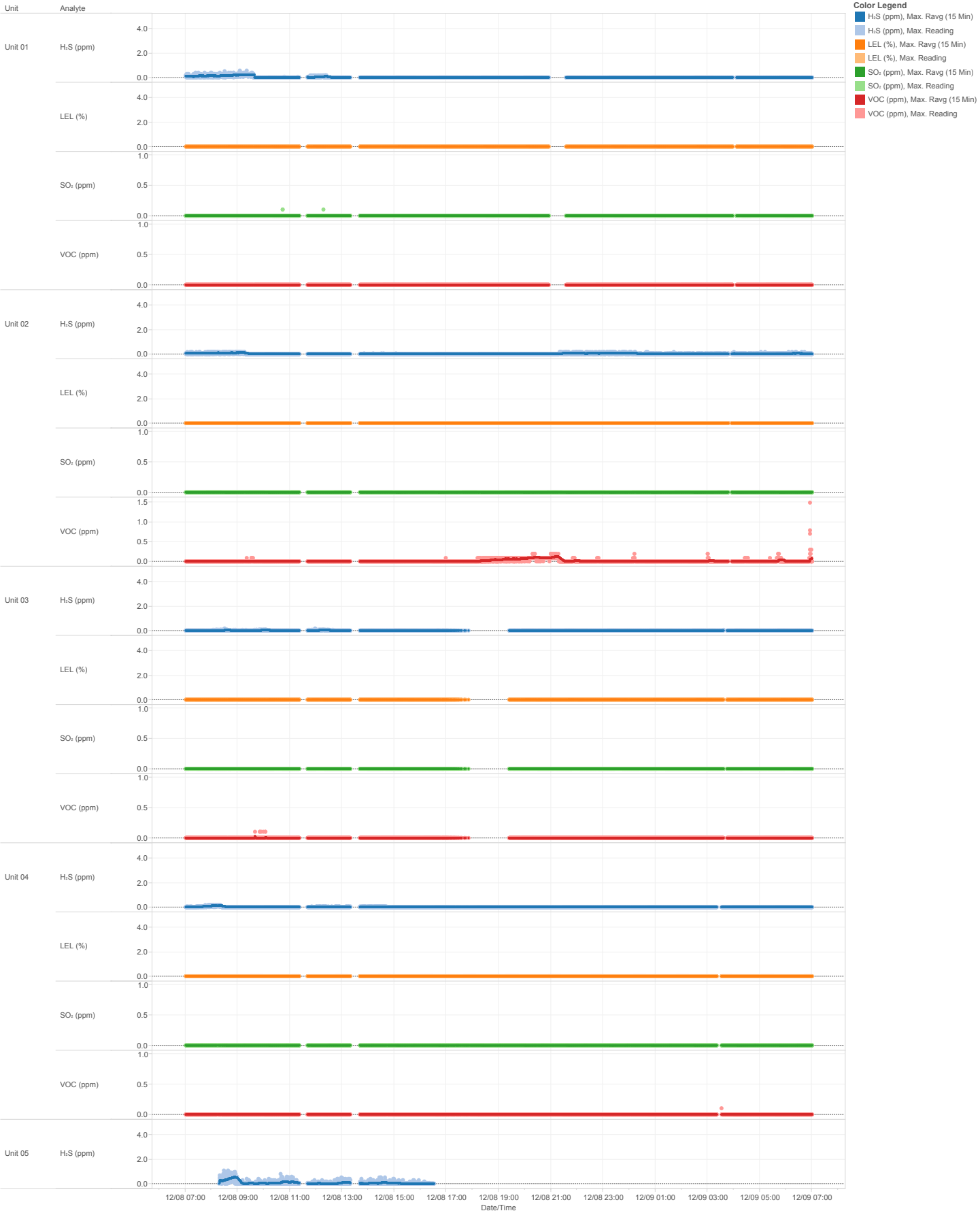
0 0.125 0.25 0.5 Miles

Appendix B:

AreaRAE Trend Graphs, AM510
Trend Graphs, and
AreaRAE/AM510 Air Monitoring
Location Map



Patriot Environmental
AreaRAE Trend Graphs
12/08/2014 07:00 - 12/09/2014 07:00



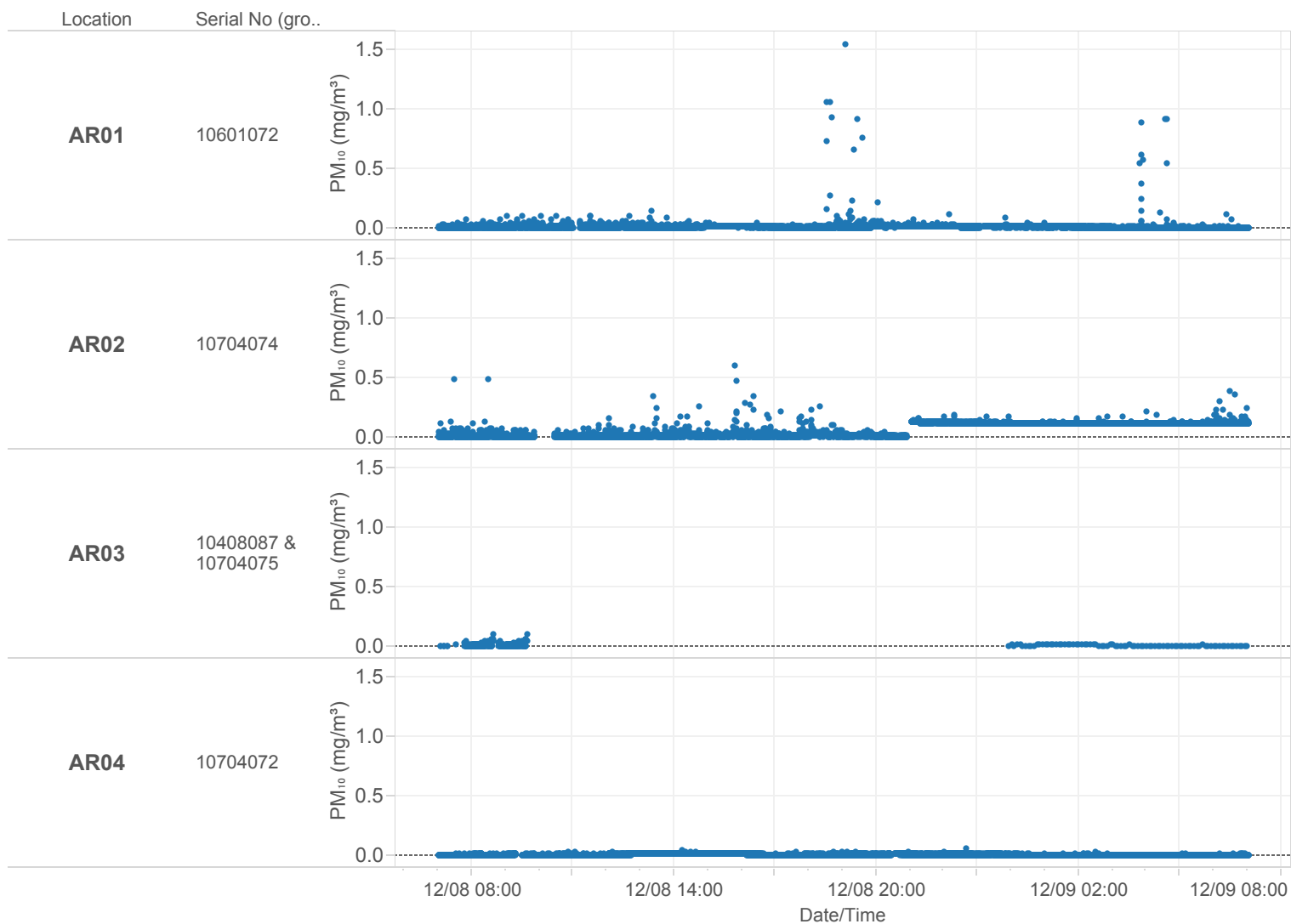
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/08/2014 07:00 - 12/09/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/08/2014 07:00 - 12/09/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format